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(74) Agents: **RICHARDS, Robert, E.**; Kilpatrick Stockton LLP, Suite 2800, 1100 Peachtree Street, Atlanta, GA 30309 et al. (US).

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(54) Title: WATER-DISPERSIBLE, CATIONIC POLYMERS, A METHOD OF MAKING SAME AND ITEMS USING SAME

(57) Abstract: The present invention is directed to triggerable, water-dispersible cationic polymers. The present invention is also directed to a method of making triggerable, water-dispersible cationic polymers and their applicability as binder compositions. The present invention is further directed to fiber-containing fabrics and webs comprising triggerable, water-dispersible binder compositions and their applicability in water-dispersible personal care products, such as wet wipes.

CLAIMS

What is Claimed is:

- 5 1. A composition comprising a triggerable cationic polymer and a divalent metal salt capable of forming a complex anion.
2. The composition of Claim 1, wherein said divalent metal salt is selected from ZnX_2 , MgX_2 , and CaX_2 , wherein X is a halogen atom.
- 10 3. The composition of Claim 2, wherein said halogen atom is selected from Cl, Br and I.
4. The composition of Claim 1, wherein said divalent metal salt is selected from $ZnCl_2$, $MgCl_2$, and $CaCl_2$.
- 15 5. A composition comprising a triggerable cationic polymer and a compound selected from ZnX_2 , MgX_2 , and CaX_2 , wherein X is a halogen atom.
- 20 6. The composition of Claim 5, wherein said halogen atom is selected from Cl, Br and I.
7. The composition of Claim 1, wherein said compound is selected from $ZnCl_2$, $MgCl_2$, and $CaCl_2$.
- 25 8. The composition of Claim 1, wherein said polymer comprises a cationic monomer and at least one water insoluble, hydrophobic monomer.
9. The composition of Claim 8, wherein said polymer is formed by the polymerization of unsaturated vinyl monomers.
- 30 10. The composition of Claim 8, where said cationic monomer is selected from [2-(methacryloyloxy)ethyl] trimethyl ammonium chloride, (3-acrylamidopropyl) trimethylammonium chloride, N,N-diallyldimethylammonium chloride, acryloxyethyltrimethyl ammonium chloride, acryloxyethyldimethylbenzyl ammonium chloride, methacryloxyethyldimethyl ammonium chloride, methacryloxyethyltrimethylbenzyl ammonium chloride and quaternized vinyl pyridine.

11. The composition of Claim 8, wherein said water insoluble hydrophobic monomer is selected from n-butyl acrylate and 2-ethylhexyl acrylate.
- 5
12. The composition of Claim 8, wherein said water insoluble hydrophobic monomer is selected from n-alkyl, branched alkyl, acrylamide, and acrylic esters.
- 10
13. The composition of Claim 8, wherein said water insoluble hydrophobic monomer is an n-alkyl or branched vinyl function monomer.
14. The composition of Claim 8 further comprising a hydrophilic or water-soluble nonionic monomer.
- 15
15. The composition of Claim 14, wherein said hydrophilic or water-soluble nonionic monomer is selected from acrylamide, methacrylamide, substituted acrylamides, substituted methacrylamides, hydroxyalkyl acrylates, hydroxyalkyl methacrylates, polyethyleneglycol acrylates, polyethyleneglycol methacrylates, and vinyl pyrrolidone.
- 20
16. A composition comprising a triggerable cationic polymer comprising [2-(methacryloyloxy)ethyl] trimethyl ammonium chloride, n-butyl acrylate and 2-ethylhexyl acrylate and a divalent metal salt capable of forming a complex anion.
- 25
17. The composition of Claim 16, wherein said divalent metal salt is selected from ZnX_2 , MgX_2 , and CaX_2 , wherein X is a halogen atom.
- 30
18. The composition of Claim 17, wherein said halogen atom is selected from Cl, Br and I.
19. The composition of Claim 16, wherein said divalent metal salt is selected from $ZnCl_2$, $MgCl_2$, and $CaCl_2$.
- 35
20. A binder composition for binding fibrous material into an integral web, said binder composition comprising the polymer of Claim 1.

21. A nonwoven fabric comprising fibrous material and a binder material, said binder material comprising the polymer of Claim 1.

22. A fibrous substrate comprising:
fibrous material; and
a binder composition for binding said fibrous material into an integral web, said binder composition comprising a triggerable cationic polymer and a divalent metal salt capable of forming a complex anion.

23. The fibrous substrate of Claim 22, wherein said divalent metal salt is selected from ZnX_2 , MgX_2 , and CaX_2 , wherein X is a halogen atom.

24. The fibrous substrate of Claim 23, wherein said halogen atom is selected from Cl, Br and I.

25. The fibrous substrate of Claim 22, wherein said divalent metal salt is selected from $ZnCl_2$, $MgCl_2$, and $CaCl_2$.

26. The fibrous substrate of Claim 22, wherein said polymer comprises a cationic monomer and at least one water insoluble, hydrophobic monomer.

27. The fibrous substrate of Claim 26, where said cationic monomer is selected from [2-(methacryloyloxy)ethyl] trimethyl ammonium chloride, (3-acrylamidopropyl) trimethylammonium chloride, N,N-diallyldimethylammonium chloride, acryloxyethyltrimethyl ammonium chloride, acryloxyethyldimethylbenzyl ammonium chloride, methacryloxyethyldimethyl ammonium chloride, methacryloxyethyltrimethylbenzyl ammonium chloride and quaternized vinyl pyridine.

28. The fibrous substrate of Claim 26, wherein said water insoluble hydrophobic monomer is selected from n-butyl acrylate and 2-ethylhexyl acrylate.

29. The fibrous substrate of Claim 26, wherein said water insoluble hydrophobic monomer is selected from n-alkyl, branched alkyl, acrylamide, and acrylic esters.

30. The fibrous substrate of Claim 26, wherein said water insoluble hydrophobic monomer is an n-alkyl or branched vinyl function monomer.

31. The fibrous substrate of Claim 26 further comprising at least one
5 hydrophilic or water-soluble nonionic monomer.

32. The fibrous substrate of Claim 31, wherein said hydrophilic or water-soluble nonionic monomer is selected from acrylamide, methacrylamide, substituted acrylamides, substituted methacrylamides, hydroxyalkyl acrylates,
10 hydroxyalkyl methacrylates, polyethyleneglycol acrylates, polyethyleneglycol methacrylates, and vinyl pyrrolidone.

33. The fibrous substrate of Claim 22, wherein said cationic polymer comprises [2-(methacryloyloxy)ethyl] trimethyl ammonium chloride, n-butyl
15 acrylate and 2-ethylhexyl acrylate and said divalent metal salt is selected from $ZnCl_2$, $MgCl_2$, and $CaCl_2$.

34. A fibrous substrate comprising:
fibrous material; and
20 a binder composition for binding said fibrous material into an integral web, said binder composition comprising a triggerable cationic polymer and a divalent metal ion that is capable of forming a complex anion.

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(54) Title: WATER-DISPERSIBLE, CATIONIC POLYMERS, A METHOD OF MAKING SAME AND ITEMS USING SAME

(57) Abstract: The present invention is directed to triggerable, water-dispersible cationic polymers. The present invention is also directed to a method of making triggerable, water-dispersible cationic polymers and their applicability as binder compositions. The present invention is further directed to fiber-containing fabrics and webs comprising triggerable, water-dispersible binder compositions and their applicability in water-dispersible personal care products, such as wet wipes.

CLAIMS

What is Claimed is:

- 5 1. A wet wipe comprising:
 a fibrous material;
 a binder composition for binding said fibrous material into an
integral web, said binder composition comprising a triggerable cationic
polymer; and
10 said fibrous material being wetted by a wetting solution
containing at least about 0.5 weight percent of a divalent metal salt which is
capable of forming a complex anion.
2. The wet wipe of Claim 1, wherein said divalent metal salt is
15 selected from ZnX_2 , MgX_2 , and CaX_2 , wherein X is a halogen atom.
3. The wet wipe of Claim 2, wherein said halogen atom is selected
from Cl, Br and I.
- 20 4. The wet wipe of Claim 1, wherein said divalent metal salt is
selected from $ZnCl_2$, $MgCl_2$, and $CaCl_2$.
5. The wet wipe of Claim 1, wherein said polymer comprises a
cationic monomer and at least one water insoluble, hydrophobic monomer.
25
6. The wet wipe of Claim 5, where said cationic monomer is
selected from [2-(methacryloyloxy)ethyl] trimethyl ammonium chloride, (3-
acrylamidopropyl) trimethylammonium chloride, N,N-
diallyldimethylammonium chloride, acryloxyethyltrimethyl ammonium
30 chloride, acryloxyethyldimethylbenzyl ammonium chloride,
methacryloxyethyldimethyl ammonium chloride,
methacryloxyethyltrimethylbenzyl ammonium chloride and quaternized vinyl
pyridine.
- 35 7. The wet wipe of Claim 5, wherein said water insoluble
hydrophobic monomer is selected from n-butyl acrylate and 2-ethylhexyl
acrylate.

8. The wet wipe of Claim 5, wherein said water insoluble hydrophobic monomer is selected from n-alkyl, branched alkyl, acrylamide, and acrylic esters.

5 9. The wet wipe of Claim 5, wherein said water insoluble hydrophobic monomer is an n-alkyl or branched vinyl function monomer.

10 10. The wet wipe of Claim 5 further comprising a hydrophilic or water-soluble nonionic monomer.

11. The wet wipe of Claim 10, wherein said hydrophilic or water-soluble nonionic monomer is selected from acrylamide, methacrylamide, substituted acrylamide, substituted methacrylamides, hydroxyalkyl acrylates, hydroxyalkyl methacrylates, polyethyleneglycol acrylates, polyethyleneglycol methacrylates, and vinyl pyrrolidone.

12. A wet wipe comprising:
a fibrous material;
a binder composition for binding said fibrous material into an integral web, said binder composition comprising a polymer of [2-(methacryloyloxy)ethyl] trimethyl ammonium chloride, n-butyl acrylate and 2-ethylhexyl acrylate; and
said fibrous material being wetted by a wetting solution containing at least about 0.5 weight percent divalent metal salt that is capable of forming a complex anion.

13. The wet wipe of Claim 12, wherein said divalent metal salt is selected from ZnCl_2 , MgCl_2 , and CaCl_2 .

14. A method of making a wet wipe comprising:
forming a substrate of fibrous material;
applying to said substrate a binder composition for said fibrous material comprising a cationic polymer; and
applying to said substrate a wetting solution containing at least about 0.5 weight percent divalent metal salt that is capable of forming a complex anion.

15. The method of Claim 14, wherein said divalent metal salt is selected from ZnX_2 , MgX_2 , and CaX_2 , wherein X is a halogen atom.

16. The method of Claim 14, wherein said halogen atom is selected from Cl, Br and I.
- 5 17. The method of Claim 14, wherein said divalent metal salt is selected from $ZnCl_2$, $MgCl_2$, and $CaCl_2$.
18. The method of Claim 14, wherein said cationic polymer comprises a cationic monomer and at least one water insoluble, hydrophobic
10 monomer.
19. The method of Claim 18, where said cationic monomer is selected from [2-(methacryloyloxy)ethyl] trimethyl ammonium chloride, (3-Acrylamidopropyl) trimethylammonium chloride, N,N-diallyldimethylammonium chloride, acryloxyethyltrimethyl ammonium
15 chloride, acryloxyethyldimethylbenzyl ammonium chloride, methacryloxyethyldimethyl ammonium chloride, methacryloxyethyltrimethylbenzyl ammonium chloride and quaternized vinyl pyridine.
- 20 20. The method of Claim 18, wherein said water insoluble hydrophobic monomer is selected from n-butyl acrylate and 2-ethylhexyl acrylate.
- 25 21. The method of Claim 18, wherein said water insoluble hydrophobic monomer is selected from n-alkyl, branched alkyl, acrylamide, and acrylic esters.
22. The method of Claim 18, wherein said water insoluble
30 hydrophobic monomer is an n-alkyl or branched vinyl function monomer.
23. The method of Claim 18 further comprising a hydrophilic or water-soluble nonionic monomer.
- 35 24. The method of Claim 23, wherein said hydrophilic or water-soluble nonionic monomer is selected from acrylamide, methacrylamides, substituted acrylamides, substituted methacrylamides, hydroxyalkyl acrylates, hydroxyalkyl methacrylates, polyethyleneglycol acrylates, polyethyleneglycol methacrylates, and vinyl pyrrolidone.

25. A method of making a wet wipe comprising:
- forming a substrate of fibrous material;
 - applying to said substrate a binder composition for said fibrous
- 5 material comprising a triggerable cationic polymer and a divalent metal salt that is capable of forming a complex anion; and
- applying to said substrate a wetting solution.

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CLAIMS

What is Claimed is:

- 5 1. A composition comprising a triggerable cationic polymer,
 wherein the composition is triggerable.
2. A composition comprising a triggerable cationic polymer,
 wherein the polymer formulation is insoluble in a solution containing a
10 sufficient amount of an insolublizing agent and is dispersible in water
 containing up to about 500 ppm of one or more multivalent ions.
3. A composition comprising a triggerable cationic polymer,
 wherein the polymer formulation is insoluble in an aqueous solution containing
15 at least about 0.5 weight percent of an insolublizing agent and is dispersible in
 water containing up to about 500 ppm of one or more multivalent ions.
4. A composition comprising a triggerable cationic polymer,
 wherein the polymer formulation is insoluble in a neutral salt solution
20 containing at least about 2 weight percent salt; and wherein the polymer
 formulation is soluble in water containing up to about 500 ppm of one or more
 multivalent ions.
5. A composition comprising a triggerable cationic polymer,
25 wherein the polymer formulation has wet strength in a neutral salt solution
 containing at least about 2 weight percent salt; and wherein the polymer
 formulation is dispersible in hard or soft water.
6. A composition comprising a triggerable cationic polymer,
 wherein the polymer formulation is insoluble in water that contains a sufficient
30 amount of an insoubilizing agent; and wherein the polymer formulation is
 soluble in water containing an insufficient amount of an insolubilizing agent.
7. A binder composition for binding fibrous material into an
 integral web, said binder composition comprising the composition of Claim 1.
35 8. A nonwoven fabric comprising fibrous material and a binder
 material, said binder material comprising the composition of Claim 1.

9. A fibrous substrate comprising:
fibrous material; and
a binder composition for binding said fibrous material into an
integral web, said binder composition comprising a triggerable cationic
5 polymer.
10. A water-dispersible article comprising the fibrous substrate of
Claim 9.
- 10 11. A wet wipe comprising:
a fibrous material;
a binder composition for binding said fibrous material into an
integral web, said binder composition comprising a triggerable cationic
polymer; and
15 said fibrous material being wetted by a wetting solution
containing at least about 2 weight percent salt.
12. A method of making a wet wipe comprising:
forming a substrate of fibrous material;
20 applying to said substrate a binder composition for said fibrous
material comprising a triggerable cationic polymer; and
applying to said substrate a wetting solution containing a
sufficient amount of an insolublizing agent such that said polymer is insoluble
in said wetting solution.
25
13. A method of making a wet wipe comprising:
forming a substrate of fibrous material;
applying to said substrate a binder composition for said fibrous
material comprising a triggerable cationic polymer; and
30 applying to said substrate a wetting solution containing at
least about 2 weight percent salt.
14. A method comprising applying to a substrate of fibrous material
a binder composition for said fibrous material comprising a triggerable cationic
35 polymer.

15. A composition comprising a triggerable cationic polymer, wherein the polymer formulation has wet strength in an aqueous solution containing at least about 0.5 weight percent of an insolublizing agent; and wherein the polymer formulation is dispersible in hard or soft water.

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16. A composition comprising a triggerable cationic polymer, wherein the polymer formulation has wet strength in an aqueous solution independent of the pH of said aqueous solution, said aqueous solution containing at least about 0.5 weight percent of an insolubilizing agent and wherein the polymer formulation is dispersible in hard or soft water.

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17. A binder composition for binding fibrous material into an integral web, said binder composition comprising the composition of Claim 15.

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18. A nonwoven fabric comprising fibrous material and a binder material, said binder material comprising the composition of Claim 15.

19. A wet wipe comprising:
a fibrous material;
a binder composition for binding said fibrous material into an integral web, said binder composition comprising a triggerable cationic polymer; and
said fibrous material being wetted by a wetting solution containing at least about 0.5 weight percent of an insolublizing agent.

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20. A method of making a wet wipe comprising:
forming a substrate of fibrous material;
applying to said substrate a binder composition for said fibrous material comprising a triggerable cationic polymer; and
applying to said substrate a wetting solution containing at least about 0.5 weight percent of an insolublizing agent.

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21. A composition comprising a triggerable cationic polymer, wherein the polymer formulation is insoluble in an aqueous solution containing at least about 0.5 weight percent of a divalent metal salt capable of forming a complex anion.

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Declarations under Rule 4.17:

- as to applicant's entitlement to apply for and be granted a patent (Rule 4.17(ii)) for all designations
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(54) Title: WATER-DISPERSIBLE, CATIONIC POLYMERS, A METHOD OF MAKING SAME AND ITEMS USING SAME

(57) Abstract: The present invention is directed to triggerable, water-dispersible cationic polymers. The present invention is also directed to a method of making triggerable, water-dispersible cationic polymers and their applicability as binder compositions. The present invention is further directed to fiber-containing fabrics and webs comprising triggerable, water-dispersible binder compositions and their applicability in water-dispersible personal care products, such as wet wipes.

CLAIMS

What is Claimed is:

- 5 1. A polymer comprising a cationic monomer and at least one hydrophobic monomer, wherein said polymer is triggerable.
2. A polymer comprising a cationic monomer, at least one hydrophobic monomer and at least one water-soluble or hydrophilic monomer,
10 wherein said polymer is triggerable.
3. A polymer comprising a quaternary ammonium monomer and at least one hydrophobic monomer, wherein said polymer is triggerable.
- 15 4. The polymer of Claim 3 further comprising at least one water-soluble or hydrophilic monomer.
5. A polymer comprising [2-(methacryloyloxy)ethyl] trimethyl ammonium chloride and at least one hydrophobic monomer, wherein said
20 polymer is triggerable.
6. The polymer of Claim 5 further comprising at least one water-soluble or hydrophilic monomer.
- 25 7. A polymer comprising [2-(methacryloyloxy)ethyl] trimethyl ammonium chloride, n-butyl acrylate and 2-ethylhexyl acrylate.
8. A composition comprising a polymer comprising [2-(methacryloyloxy)ethyl] trimethyl ammonium chloride, n-butyl acrylate and 2-ethylhexyl acrylate.
30
9. A binder composition for binding fibrous material into an integral web, said binder composition comprising the polymer of Claim 1.
- 35 10. A nonwoven fabric comprising fibrous material and a binder material, said binder material comprising the polymer of Claim 1.
11. A binder composition for binding fibrous material into an integral web, said binder composition comprising the polymer of Claim 2.

12. A nonwoven fabric comprising fibrous material and a binder material, said binder material comprising the polymer of Claim 2.

5 13. A binder composition for binding fibrous material into an integral web, said binder composition comprising the polymer of Claim 3.

14. A nonwoven fabric comprising fibrous material and a binder material, said binder material comprising the polymer of Claim 3.

10 15. A binder composition for binding fibrous material into an integral web, said binder composition comprising the polymer of Claim 4.

16. A nonwoven fabric comprising fibrous material and a binder material, said binder material comprising the polymer of Claim 4.

17. A fibrous substrate comprising:
fibrous material; and
a binder composition for binding said fibrous material into an
20 integral web, said binder composition comprising a polymer comprising a cationic monomer and at least one hydrophobic monomer.

18. The fibrous substrate of Claim 17, wherein said polymer further comprises at least one water-soluble or hydrophilic monomer.

25 19. The fibrous substrate of Claim 17, wherein said cationic monomer comprises a quaternary ammonium monomer.

20. The fibrous substrate of Claim 17, wherein said polymer further
30 comprises at least one water-soluble or hydrophilic monomer.

21. A water-dispersible article comprising the fibrous substrate of Claim 18.

35 22. A water-dispersible article comprising the fibrous substrate of Claim 19.

23. A water-dispersible article comprising the fibrous substrate of Claim 20.

24. A water-dispersible article comprising the fibrous substrate of Claim 23.

5 25. A wet wipe comprising:
 a fibrous material;
 a binder composition for binding said fibrous material into an
integral web, said binder composition comprising a polymer comprising a
cationic monomer and at least one hydrophobic monomer; and
10 said fibrous material being wetted by a wetting solution
containing a sufficient amount of an insolubilizing agent such that said binder
composition is insoluble in said wetting solution.

26. The wet wipe of Claim 25, wherein said copolymer further
15 comprises at least one water-soluble or hydrophilic monomer.

27. The wet wipe of Claim 25, wherein said cationic monomer
comprises a quaternary ammonium monomer.

20 28. The wet wipe of Claim 27, wherein said polymer further
comprises at least one water-soluble or hydrophilic monomer.

29. The wet wipe of Claim 25, wherein said cationic monomer
comprises [2-(methacryloyloxy)ethyl] trimethyl ammonium chloride.

25 30. The wet wipe of Claim 29, wherein said polymer further
comprises at least one water-soluble or hydrophilic monomer.

31. The wet wipe of Claim 29, wherein said polymer comprises [2-
30 (methacryloyloxy)ethyl] trimethyl ammonium chloride, n-butyl acrylate and 2-
ethylhexyl acrylate.

32. A method of making a wet wipe comprising:
forming a substrate of fibrous material;
applying to said substrate a binder composition comprising a
copolymer comprising a cationic monomer and at least one hydrophobic
5 monomer; and
applying to said substrate a wetting solution containing a
sufficient amount of an insolubilizing agent such that said binder composition is
insoluble in said wetting solution.

10 33. The method of Claim 32, wherein said copolymer further
comprises at least one water-soluble or hydrophilic monomer.

34. The method of Claim 32, wherein said cationic monomer is a
quaternary ammonium monomer.

15 35. The method of Claim 32, wherein said polymer comprises [2-
(methacryloyloxy)ethyl] trimethyl ammonium chloride, n-butyl acrylate and 2-
ethylhexyl acrylate.

20 36. The method of Claim 32, wherein said insolubilizing agent is
selected from NaCl, ZnCl₂, and mixtures thereof.

37. A method comprising:
applying to a substrate of fibrous material;
25 a binder composition for said fibrous material comprising the
polymerization product of a cationic monomer and at least one hydrophobic
monomer.

38. The method of Claim 37, wherein said binder further comprises
30 the polymerization product of at least one hydrophilic monomer.

39. The method of Claim 37, wherein said cationic monomer is a
quaternary ammonium monomer.

35 40. The method of Claim 37, wherein said polymer comprises [2-
(methacryloyloxy)ethyl] trimethyl ammonium chloride, n-butyl acrylate and 2-
ethylhexyl acrylate.

41. The method of Claim 40, wherein said polymer further comprises at least one water-soluble or hydrophilic monomer.

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(57) Abstract: The present invention is directed to triggerable, water-dispersible cationic polymers. The present invention is also directed to a method of making triggerable, water-dispersible cationic polymers and their applicability as binder compositions. The present invention is further directed to fiber-containing fabrics and webs comprising triggerable, water-dispersible binder compositions and their applicability in water-dispersible personal care products, such as wet wipes.

CLAIMS

What is Claimed is:

- 5 1. A composition comprising the polymerization product of [2-(methacryloyloxy)ethyl] trimethyl ammonium chloride and at least one hydrophobic monomer, wherein said composition is triggerable.
- 10 2. The composition of Claim 1, wherein said composition comprises the polymerization product of acrylamide, [2-(methacryloyloxy)ethyl] trimethyl ammonium chloride and at least one hydrophobic monomer.
- 15 3. A polymer comprising [2-(methacryloyloxy)ethyl] trimethyl ammonium chloride and at least one hydrophobic monomer, wherein said composition is triggerable.
- 20 4. The polymer of Claim 3, further comprising at least one hydrophilic monomer.
5. The polymer of Claim 3, further comprising acrylamide.
- 25 6. A polymer comprising butyl acrylate, 2-ethylhexyl acrylate and [2-(methacryloyloxy)ethyl] trimethyl ammonium chloride.
7. The polymer of Claim 6 further comprising acrylamide.
- 30 8. The polymer of Claim 7, wherein said butyl acrylate comprises greater than 0 to about 80 mole percent, said 2-ethylhexyl acrylate comprises greater than 0 to about 75 mole percent, said [2-(methacryloyloxy)ethyl] trimethyl ammonium chloride comprises greater than 5 to about 60 mole percent, and said acrylamide comprises greater than 0 to about 60 mole percent of said polymer.
- 35 9. A binder composition for binding fibrous material into an integral web, said binder composition comprising the composition of Claim 1.
10. A nonwoven fabric comprising fibrous material and a binder material, said binder material comprising the composition of Claim 1.

11. A binder composition for binding fibrous material into an integral web, said binder composition comprising the composition of Claim 2.
- 5 12. A nonwoven fabric comprising fibrous material and a binder material, said binder material comprising the composition of Claim 2.
13. A fibrous substrate comprising:
fibrous material; and
10 a binder composition for binding said fibrous material into an integral web, said binder composition comprising the polymerization product of [2-(methacryloyloxy)ethyl] trimethyl ammonium chloride and at least one hydrophobic monomer.
- 15 14. The fibrous substrate of Claim 13, wherein said binder composition further comprises the polymerization product of at least one hydrophilic monomer.
- 20 15. The fibrous substrate of Claim 13, wherein said binder composition further comprises the polymerization product of acrylamide.
- 25 16. The fibrous substrate of Claim 13, wherein said binder composition comprises the polymerization product of butyl acrylate, 2-ethylhexyl acrylate and [2-(methacryloyloxy)ethyl] trimethyl ammonium chloride.
17. The fibrous substrate of Claim 16, wherein said binder composition further comprises the polymerization product of acrylamide.
- 30 18. A water-dispersible article comprising the fibrous substrate of Claim 13.
19. A water-dispersible article comprising the fibrous substrate of Claim 15.
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20. A wet wipe comprising:
a fibrous material;
a binder composition for binding said fibrous material into an integral web, said binder composition comprising the polymerization product of
5 [2-(methacryloyloxy)ethyl] trimethyl ammonium chloride and at least one hydrophobic monomer; and
said fibrous material being wetted by a wetting solution containing a sufficient amount of an insolubilizing agent such that said binder composition is insoluble in said wetting solution.
- 10 21. The wet wipe of Claim 20, wherein said binder composition further comprises the polymerization product of at least one hydrophilic monomer.
- 15 22. The wet wipe of Claim 20, wherein said binder composition further comprises the polymerization product of acrylamide.
- 20 23. The wet wipe of Claim 20, wherein said binder composition further comprises the polymerization product of butyl acrylate, 2-ethylhexyl acrylate and [2-(methacryloyloxy)ethyl] trimethyl ammonium chloride.
- 25 24. The wet wipe of Claim 20, wherein said binder composition further comprises the polymerization product of acrylamide, butyl acrylate, 2-ethylhexyl acrylate and [2-(methacryloyloxy)ethyl] trimethyl ammonium chloride.
- 30 25. A method of making a wet wipe comprising:
forming a substrate of fibrous material;
applying to said substrate a binder composition comprising the polymerization product of [2-(methacryloyloxy)ethyl] trimethyl ammonium
chloride and at least one hydrophobic monomer; and
applying to said substrate a wetting solution containing a
sufficient amount of an insolubilizing agent such that said binder composition is
insoluble in said wetting solution.
- 35 26. The method of Claim 25, wherein said binder composition further comprises the polymerization product of at least one hydrophilic monomer.

27. The wet wipe of Claim 25, wherein said binder composition further comprises the polymerization product of acrylamide.

28. The wet wipe of Claim 25, wherein said binder composition
5 comprises the polymerization product of butyl acrylate, 2-ethylhexyl acrylate and [2-(methacryloyloxy)ethyl] trimethyl ammonium chloride.

29. The wet wipe of Claim 25, wherein said binder composition
10 comprises the polymerization product of acrylamide, butyl acrylate, 2-ethylhexyl acrylate and [2-(methacryloyloxy)ethyl] trimethyl ammonium chloride.

30. A method comprising:
applying to a substrate of fibrous material;
15 a binder composition for said fibrous material comprising the polymerization product of [2-(methacryloyloxy)ethyl] trimethyl ammonium chloride and at least one hydrophobic monomer.

31. The method of Claim 30, wherein said binder composition
20 further comprises the polymerization product of at least one hydrophilic monomer.

32. The wet wipe of Claim 30, wherein said binder composition
25 further comprises the polymerization product of acrylamide.

33. The wet wipe of Claim 30, wherein said binder composition
comprises the polymerization product of butyl acrylate, 2-ethylhexyl acrylate
and [2-(methacryloyloxy)ethyl] trimethyl ammonium chloride.

34. The wet wipe of Claim 30, wherein said binder composition
30 comprises the polymerization product of acrylamide, butyl acrylate, 2-ethylhexyl acrylate and [2-(methacryloyloxy)ethyl] trimethyl ammonium chloride.

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